

What Is Claimed Is:

1. An optical module comprising:

5 a mounting member having a mounting portion, a supporting face, and a terminal, said terminal being provided in said mounting portion, said terminal being electrically connected to said optical semiconductor element, and said mounting portion being provided for mounting an optical semiconductor element; and

10 a lens holding member having one end portion, another end portion, a side wall portion, and a holding portion, said side wall portion and holding portion being arranged in a direction of a predetermined axis between said one end portion and other end portion, said lens holding member being provided on the supporting face of said mounting member so as to cover
15 said optical semiconductor element;

wherein said holding portion holds a lens optically coupled to said optical semiconductor element;

20 wherein said side wall portion has first and second inner surfaces;

wherein said first inner surface extends from said one end portion in a direction of said predetermined axis;

25 wherein said second inner surface extends from said holding portion in a direction of said

predetermined axis;

wherein said first inner surface is located outside a reference surface, said reference surface extending in a direction of said predetermined axis, and said reference surface intersecting with said supporting face to form a closed loop surrounding said mounting portion; and

wherein said second inner surface is located inside said reference surface.

2. The optical module according to claim 1,

wherein said lens holding member has first and second outer surfaces arranged along said predetermined axis;

wherein said first outer surface is provided such that said lens holding member can be held by an electrode of a seam sealer apparatus; and

wherein said second outer surface extends from said one end portion of said lens holding member in a direction of said predetermined axis, and is provided such that said lens holding member can be held by an electrode of a seam sealer apparatus.

3. The optical module according to claim 2,

wherein said lens holding member has a third outer surface provided between said first and second outer surfaces; and

wherein said third outer surface is provided such

that said third outer surface is able to receive force applied in a direction of said predetermined axis via an electrode for a seam sealer apparatus.

4. The optical module according to claim 1,
5 further comprising a sleeve capable of receiving an optical connector therein, said optical connector being capable of being optically coupled to said optical module;

10 wherein the other end portion of said lens holding member supports said sleeve.

5. The optical module according to claim 1, wherein said lens holding member is contained within a cylinder with a diameter of 4.5 mm.

6. The optical module according to claim 1,
15 wherein said lens holding member comprises first to third outer surfaces;

wherein said first outer surface extends from said one end portion in a direction of said predetermined axis;

20 wherein said second outer surface extends from said other end portion in a direction of said predetermined axis;

wherein said supporting face and said third outer surface extend in a direction in which a reference
25 plane extends; and

wherein said mounting member has a plurality of

additional terminals, a first face, a second face, and a plurality of holes, said mounting portion being provided in said first face, said second face being opposed to said first face, and said terminal and said plurality of additional terminals passing through said holes;

wherein each hole has a side face extending from said first face to said second face in a direction of said predetermined axis;

10 wherein said second inner surface of said lens holding member is located inside a reference cylinder, said reference cylinder extending in a direction of said predetermined axis, and said reference cylinder circumscribing the side faces of all holes; and

15 wherein said first inner surface of said lens holding member is located outside said reference cylinder.

7. The optical module according to claim 1,

20 wherein the other end portion of said lens holding member has a mounting face for mounting a sleeve holder; and

25 wherein said lens holding member is positioned inside another reference surface, the other reference surface being provided so as to make contact with the side face of said mounting member, and the other reference surface extending in a direction of

said predetermined axis.

8. The optical module according to claim 1, further comprising a welding portion for bonding said one end portion of said mounting member with said supporting face;

wherein said lens holding member has a first outer surface extending from said one end portion in a direction of said predetermined axis; and

wherein a center line between inner and outer edges of said welding portion is positioned outside a center line between said first outer surface and said first inner surface.

9. The optical module according to claim 1,

wherein said lens holding member comprises first to third outer surfaces;

wherein said first outer surface extends from said one end portion by a first distance taken with respect to a direction of said predetermined axis;

wherein said second outer surface extends from said other end portion by a second distance taken with respect to a direction of said predetermined axis;

wherein said first outer surface is located outside another reference surface, said reference surface extending in a direction of said predetermined axis and intersecting with said mounting member to form a predetermined closed line surrounding said mounting

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portion;

wherein said second outer surface is located inside said other reference surface;

5 wherein said third outer surface connects with said first and second outer surfaces;

wherein said supporting face and said third outer face extend in a direction in which a reference plane extends; and

10 wherein said second distance is longer than said first distance.

10. The optical module according to claim 1,

15 wherein said side wall portion comprises first and second portions arranged along said predetermined axis, said first inner surface being provided in said first portion, and said second inner surface being provided in said second portion; and

wherein said the length of said first portion is shorter than the length of said second portion.

20 11. The optical module according to claim 1, further comprising a bonding wire for connecting said terminal with said optical semiconductor element;

25 wherein a distance between the lower end of said second inner surface and said supporting face is greater than a maximum distance between said bonding wire and said supporting face.

12. The optical module according to claim 1,

further comprising a bonding wire for connecting said terminal with said optical semiconductor element;

wherein a distance between said supporting face and the upper end of said first outer surface is at most four times a interval between said first inner surface and said second inner surface.

13. The optical module according to claim 1, further comprising a bonding wire for connecting said terminal with said optical semiconductor element;

wherein a distance between the upper end of said first outer surface and said supporting face is 1.0 mm or less; and

wherein a distance between the upper end of said first inner surface and said supporting face is greater than 0.5 mm.

14. The optical module according to claim 13,

wherein said terminal of said mounting member has an inner terminal portion projecting from said first face, and an outer terminal portion projecting from said second face;

wherein a length of said internal terminal is in a range of 0.2 mm to 0.4 mm; and

wherein said mounting member holds said terminal by means of a glass sealing member.

15. The optical module according to claim 1, wherein said lens holding member comprises a first to a

third outer surfaces;

wherein said first outer surface extends from said one end portion in a direction of said predetermined axis;

5 wherein said second outer surface extends from said other end portion in a direction of said predetermined axis;

wherein said first outer surface is located outside another reference surface, said other reference
10 surface extending in a direction of said predetermined axis, and said other reference surface intersecting with said supporting face to form a predetermined closed line surrounding said mounting portion;

wherein said second outer surface is located
15 inside said other reference surface;

wherein said third outer surface is connected to said first and second outer surfaces;

wherein said side wall portion further comprises a third inner surface connected to said first and second
20 inner surfaces;

wherein said supporting face and said third outer surface extend in a direction in which a reference plane extends; and

wherein said third inner surface extends along
25 another reference plane intersecting with said reference surface.

16. The optical module according to claim 1,
further comprising:

an optical fiber optically coupled to said optical
semiconductor element; and

5 a sleeve for holding said optical fiber through a
ferrule;

wherein the other end portion of said lens holding
member has a mounting face for mounting said sleeve.

17. The optical module according to claim 1,

10 wherein a length of said first inner surface is
determined so as to provide a region for housing said
optical semiconductor element and a bonding wire
connecting said optical semiconductor element and said
terminal with each other;

15 wherein a length of said inner surface is
determined to position said holding portion of said
lens holding member such that an optical coupling
between said optical semiconductor element and said
optical fiber can be achieved.

20 18. The optical module according to claim 1,

wherein said lens holding member comprises a first
outer surface extending from said one end portion by a
first distance in a direction of said reference
surface;

25 wherein said first inner surface extends from said
one end portion by a second distance in a direction of

said predetermined axis; and

wherein said first distance is greater than said second distance.

19. The optical module 1 according to claim 1,
5 further comprising a welding portion for bonding said one end portion of said lens holding member with said supporting face;

wherein said lens holding member has a first outer surface extending from its one end portion in a
10 direction of said predetermined axis;

wherein said first inner surface has an inclined face at said one end portion; and

wherein said welding portion is located between the edge of said inclined face and the edge of said
15 first outer surface.

20. The optical module according to claim 1,
further comprising a welding portion for bonding said one end portion of said lens holding member with said supporting face;

20 wherein said first outer surface of said lens holding member has an inclined face at its one end portion; and

wherein said welding portion is located between the edge of said inclined face and the edge of said
25 first inner surface.